



Dye, Fluorescent, Engine Oil Leak Detection

1 Scope

1.1 Material Description. This specification describes a liquid organic dye that when added to factory-fill engine oils, will fluoresce a bright yellow-green color when illuminated with a 365 nanometer (nm) black ultraviolet (UV) light.

1.2 Symbols. Not applicable.

1.3 Applicability. This additive is intended to pinpoint engine oil leaks.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D92
ASTM D97

ASTM D445

ASTM D1298

ASTM D2709

2.2 GM Standards/Specifications.

9985930

GMW3059

GMW15827

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Physical Properties. See Table 1.

Table 1: Physical Properties

Properties	Limits	Test Methods
Specific Gravity	0.80 to 0.84	ASTM D1298
Flash Point	125 °C minimum	ASTM D92
Sediment and Water	None detected	ASTM D2709
Viscosity at 40 °C	35 mm ² /s maximum	ASTM D445
Pour Point	0 °C maximum	ASTM D97

3.2 Compatibility. All candidates submitted to this specification shall be compatible with factory-fill engine oils GMW15827 and 9985930 when tested at both 0.5% and 1% by volume mixes.

3.3 Homogeneity Test. Fluorescent additives, after mixing, must remain uniformly soluble in the engine oil at all temperatures from the pour point of the oil to 160 °C. After the oil and additive mixture are cooled below pour point, the oil shall exhibit homogeneity on standing at a temperature which is not higher than 5 °C above its pour point.

3.4 Fluorescence Tests. Prepare a minimum concentration of the fluorescent additive (0.5% by volume) in factory-fill engine oil. Stir the mixture for three (3) minutes. Using pure factory-fill engine oil as the standard, illuminate both the standard and the prepared sample containing the fluorescent additive with a 365 nm black UV light. The prepared sample must exceed the brightness of the standard sample significantly.

3.5 Visual Color. The fluorescent additive, when added at 0.5% by volume and thoroughly mixed for three (3) minutes, must not cause the mixture to have any red coloring.

3.6 Volume Swell. A $2.0 \text{ g} \pm 0.3 \text{ g}$ sample of elastomeric material from the dispensing pump shall be totally immersed in a 100% solution of fluorescent additive described in 3.4 and 3.5 for 72 h at $23^\circ\text{C} \pm 2^\circ\text{C}$. The volume change shall not exceed 1.5%.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. All shipments of material or parts under contract or purchase order manufactured to this specification shall be equivalent in every respect to the initial samples approved by Engineering. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by Engineering. Lack of notification by the supplier constitutes grounds for rejection of any shipment. While samples may be taken from incoming shipments and checked for conformance to this specification, the supplier shall accept the responsibility for incoming shipments meeting this specification without dependence upon purchaser's inspection.

The series of tests used to approve each batch of product along with acceptance limits will be agreed upon by the purchaser and seller. The laboratory providing the certificate of analysis must also participate in a proficiency testing program (round robin) that is approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team (GSSLT) or designate. The Fuels, Fluids, and Lubricants GSSLT or designate must receive copies of the proficiency testing reports directly from the test program administrator.

5.4 Initial Source Approval. No shipment shall be made by any supplier until representative initial production samples have been approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team or designees meeting the requirements of this specification.

5.5 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements. In addition, product MSDS/SDS submissions must be in compliance with specific country General Motors TMC003 Material Safety Data Sheet/Safety Data Sheet guidance documents where available.

5.6 All materials supplied to this standard must comply with the requirements of GMW3059, **Restricted and Reportable Substances for Parts**.

6 Approved Sources

Materials supplied to this specification must be approved by General Motors.

The appropriate GM Materials Engineering department(s) must confirm material as meeting the requirements of this specification. Any test data sheets of material submitted to General Motors for such confirmation (e.g., during Production Part Approval Process (PPAP)) under this material specification must list all properties and must apply corresponding test methods of this material specification.

7 Notes

7.1 Glossary.

MATSPC: Global repository of GM approved materials for corresponding GM Engineering Standards.